

**CLAIMS**

What is claimed is:

1. A VoIP telephone comprising:

a network communication system (16) for encapsulating data into IP frames (42) for exchange with remote devices over a frame switched network (12);

a system client application (24) coupled to the network communication system (16) for exchanging call set up messages (44) with a remote VoIP gateway (36) to establish a media channel for the exchange of media session data;

a dialog system (32) coupled to the network communication system (16) for: translating frames of compressed digital audio data originated from a remote device to recreate remote voice band (54); and

detecting and translating local voice band (56) to compressed digital audio data for transmission to the VoIP gateway (36);

detecting in-band signaling received from the VoIP gateway (36); and

providing session status signals (52), corresponding to the detected in-band signaling, to a presentation module (28);

the presentation module (28) receiving the session status signals (52) driving a display of session status messages (50) on a display screen (30).

2. The VoIP telephone of claim 1, wherein the system client (24) further provides session status signals (52) to the presentation module (28) and the presentation module (28) drives the display of session status messages (50) in accordance with both the session status signals (52) from the dialog system and the system client (24).

3. The VoIP telephone of claim 2, wherein:

the in-band signaling (62) is at least one of frequency signaling, cadence signaling, and phase shift signaling within the remote voice band (54); and

the dialog system (32) detects frequency, cadence, and phase shift of the remote voice band (54) and generates a session status signal (52) corresponding to the detected in-band signaling (62).

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1 4. The VoIP telephone of claim 3, wherein:  
2 the presentation module (28) comprises a message look up table (64) storing a  
3 plurality of session status messages (50), each in association with a session status  
4 signal (52); and  
5 the presentation module (28) generates a session status message (50) on the  
6 display (30) in response to receiving a session status signal (52) by looking up the  
7 session status message (50) that corresponds to the session status signal (52) in the  
8 message look up table (64).

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1 5. A VoIP telephone comprising:  
2 a network communication system (16) for encapsulating data into IP frames (42)  
3 for exchange with remote devices over a frame switched network;  
4 a system client application (24) coupled to the network communication system  
5 (16) for exchanging call set up messages (44) with a remote VoIP gateway (36) to  
6 establish a media channel (46) for the exchange of media session data (48);  
7 a compression module (26) coupled to the network communication system (16)  
8 for:  
9 receiving session media data (48) received over the frame switched  
10 network (12) and recreating remote voice band (54) for driving a speaker;  
11 receiving a local voice band (56) corresponding to audio detected by a  
12 microphone (38) and generating media session data (48) for transmission over the  
13 frame switched network; and  
14 a display screen (30) for displaying a session status message (50) corresponding  
15 to in-band signaling (62) within the remote voice band (54).

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1 6. The VoIP telephone of claim 5, further comprising:  
2 an in-band signal detection module (60) for detecting the in-band signaling (62)  
3 within the remote voice band (54) and generating a session status signal (52)  
4 corresponding thereto; and

5 the presentation module (28) receives the session status signal (52) and  
6 generates the session status message (50) in response to receiving the session status  
7 signal.

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1 7. The VoIP telephone of claim 6, wherein:  
2 the in-band signaling (62) is at least one of frequency signaling, cadence  
3 signaling, and phase shift signaling; and  
4 the in-band signal detection module (60) detects the frequency signaling,  
5 cadence signaling, and phase shift signaling within the remote voice band and  
6 generates a session status signal (52) corresponding to detected in-band signaling (62).

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1 8. The VoIP telephone of claim 7, wherein:  
2 the presentation module (28) comprises a message look up table (64) storing a  
3 plurality of session status messages (50), each in association with a session status  
4 signal (52); and  
5 the presentation module (28) generates a session status message (50) on the  
6 display (30) in response to receiving a session status signal (52) by looking up the  
7 session status message (50) that corresponds to the session status signal (52) in the  
8 message look up table (64).

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1 9. The VoIP telephone of claim 6:  
2 wherein the system client application (24) further generates a session status  
3 signal (52) related to the media channel (46); and  
4 the presentation module (28) receives both the session status signal (52)  
5 generated by the system client application (24) and the session status signal (52)  
6 generated by the in-band signal detection module (60) and generates a plurality of  
7 session status messages (50), each in corresponding to a received session status  
8 signal (52).

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1 10. The VoIP telephone of claim 9, wherein:

2 the in-band signal (62) is at least one of a dual tone multi-frequency signal within  
3 the audio signal (54) and a polarity change of the audio signal (54); and  
4 the in-band signal detection module (60) detects both the dual tone multi-  
5 frequency signal and the polarity change within the audio signal (54) and generates a  
6 session status signal (52) corresponding to the detected in-band signal (62).  
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1 11. The VoIP telephone of claim 10, wherein:

2 the presentation module (28) comprises a message look up table (64) storing a  
3 plurality of session status messages (50), each in association with a session status  
4 signal (52); and

5 the presentation module (28) generates a session status message (50) on the  
6 display (30) in response to receiving a session status signal (52) by looking up the  
7 session status message (50) that corresponds to the session status signal (52) in the  
8 message look up table (64).  
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1 12. The VoIP telephone of claim 6, further comprising:

2 a key pad system (58) for modulating the local voice band (56) with a tone  
3 corresponding to an operator depressed key to generate an in-band signaling (62)  
4 within the local voice band (56); and

5 the in band signal detection module further detects in-band signaling within the  
6 local voice band and generates a session status signal corresponding thereto;  
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1 13. The VoIP telephone of claim 12, wherein:

2 the in-band signal (62) is at least one of a dual tone multi-frequency signal within  
3 the audio signal (54) and a polarity change of the audio signal (54); and

4 the in-band signal detection module (60) detects both the dual tone multi-  
5 frequency signal and the polarity change within the audio signal (54) and generates a  
6 session status signal (52) corresponding to the detected in-band signal (62).  
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1 14. The VoIP telephone of claim 13, wherein:

2 the presentation module (28) comprises a message look up table (64) storing a  
3 plurality of session status messages (50), each in association with a session status  
4 signal (52); and

5 the presentation module (28) generates a session status message (50) on the  
6 display (30) in response to receiving a session status signal (52) by looking up the  
7 session status message (50) that corresponds to the session status signal (52) in the  
8 message look up table (64).

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1 15. A method of operating a VoIP telephone comprising:  
2 exchanging call set up messages (44) with a remote VoIP gateway (36) to  
3 establish a media channel (46) for the exchange of media session data (48);  
4 receiving session media data (48) received over the media channel;  
5 decompressing the session media data to recreate remote voice band (54) for  
6 driving a speaker;  
7 receiving a local voice band (56) corresponding to audio detected by a  
8 microphone (38);  
9 generating media session data (48) corresponding to the local voice band for  
10 transmission over the media channel;  
11 detecting the in-band signaling (62) within the remote voice band (54); and  
12 displaying a session status message (50) corresponding to the detected in-band  
13 signaling (62) on a display screen.

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1 16. The method of operating a VoIP telephone of claim 15, wherein:  
2 the in-band signaling (62) is at least one of frequency signaling, cadence  
3 signaling, and phase shift signaling; and the method further comprises:  
4 detecting frequency signaling, cadence signaling, and phase shift signaling within  
5 the remote voice band and generating a session status signal (52) corresponding to  
6 detected in-band signaling (62).

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1 17. The method of operating a VoIP telephone of claim 16, wherein the step of

2 displaying a session status message (50) corresponding to the detected in-band  
3 signaling (62) on a display screen comprises looking up the session status message  
4 (50) that corresponds to the session status signal (52) in a message look up table (64).

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1 18. The method of operating a VoIP telephone of claim 15, further comprising:  
2 generating a session status signal (52) related to VoIP signaling during  
3 establishment of the media channel (46); and  
4 displaying a session status message (50) corresponding to the generated  
5 session status signal related to VoIP signaling.

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1 19. The method of operating a VoIP telephone of claim 18, wherein:  
2 the in-band signaling (62) is at least one of frequency signaling, cadence  
3 signaling, and phase shift signaling; and the method further comprises:  
4 detecting frequency signaling, cadence signaling, and phase shift signaling within  
5 the remote voice band and generating a session status signal (52) corresponding to  
6 detected in-band signaling (62).

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1 20. The method of operating a VoIP telephone of claim 19, wherein the step of  
2 displaying a session status message (50) corresponding to the detected in-band  
3 signaling (62) and the generated session status signal related to VoIP signaling  
4 comprises looking up the session status message (50) that corresponds to the session  
5 status signal (52) in a message look up table (64).

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1 21. The method of operating a VoIP telephone of claim 15, further comprising:  
2 modulating the local voice band (56) with a DTMF tone corresponding to an  
3 operator depressed key to generate in-band signaling (62) within the local voice band  
4 (56);  
5 detecting in-band signaling within the local voice band and generates a session  
6 status signal corresponding thereto; and  
7 displaying a session status message (50) corresponding to the detected in-band

8 signaling (62) within the local voice band on a display screen.

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1 22. The method of operating a VoIP telephone of claim 21, wherein:

2 the in-band signaling (62) is at least one of frequency signaling, cadence  
3 signaling, and phase shift signaling; and the method further comprises:

4 detecting frequency signaling, cadence signaling, and phase shift signaling within  
5 the remote voice band and generating a session status signal (52) corresponding to  
6 detected in-band signaling (62).

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1 23. The method of operating a VoIP telephone of claim 22, wherein the step of

2 displaying a session status message (50) corresponding to the detected in-band

3 signaling (62) and the generated session status signal related to VoIP signaling

4 comprises looking up the session status message (50) that corresponds to the session  
5 status signal (52) in a message look up table (64).

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